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Sequence stratigraphic interpretation of 2D seismic sections in the southern Vienna Basin

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Introduction and overview on the project area

The Vienna Basin(figure 1) is a well-studied basin. This is especially true for the basin north of Vienna. In the southern part of the basin only a few studies have been carried out, with the focus of these studies on the 3D seismic Moosbrunn (Strauss et al., 2006). In the area of the Leopoldsdorf fault system and the Schwechat depression no sequence stratigraphic interpretation has been done yet. In the project area several 2D seismic sections from the 80s are available (see figure 2). The focus of this interpretation is on the one hand on a detailed description of the prae-neogene basement, and on the other hand on the identification of the various sequences of the neogene. By applying a sequence stratigraphic approach it is possible to determine boundaries of sedimentary facies. By mapping these boundaries on several 2D seismic sections we can determine the geometries of sedimentary facies to some degree and thus to build a 3D model of the neogene sediments.

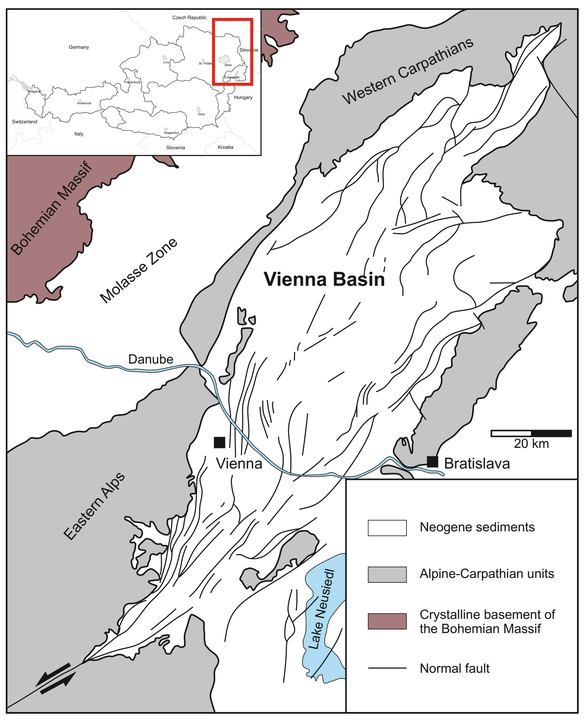

Fig. 1: Schematic geological map of the Vienna Basin (modified after Gier et al., 2008).

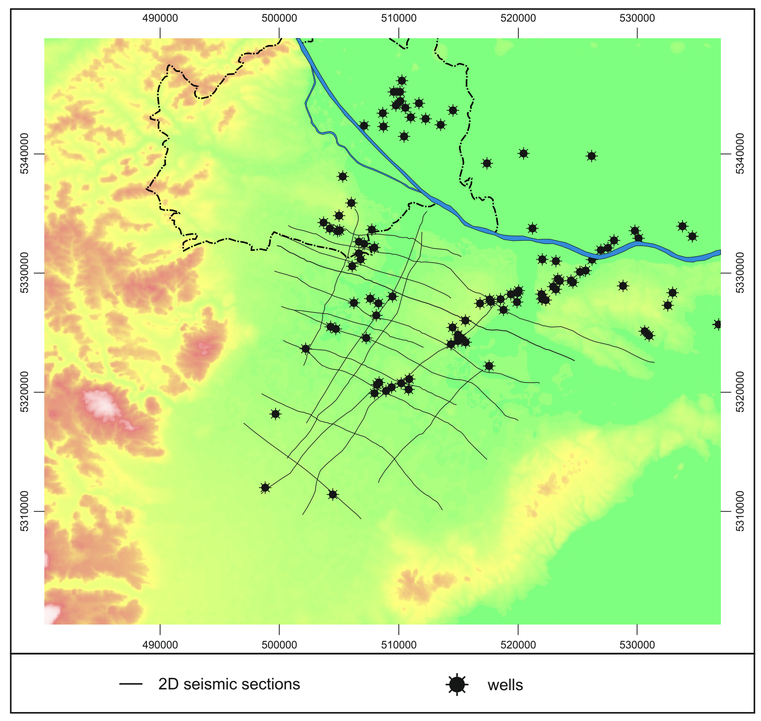

Fig. 2: Location of the available 2D seismic reflection profiles.

Results

In the Karpatian chaotic reflection patterns can be observed. Therefore, it is not possible do identify any prominent surface. The only surface that can be mapped is the top of the Karpatian (SB between Ka1 and Ba1). This surface is formed as an angular unconformity between the Badenian and Karpatian sediments. According to Weissenbäck (1996) and Strauss et al. (2006) these tilted sediments are interpreted as the Upper Karpatian fluvial/deltaic Akerklaa Formation. The lowermost zone of Ba1 shows high amplitude, parallel reflectors and is interpreted to be the lowstand systems tract of the Aderklaaer Konglomerat. The Badenian itself can be divided in three 3rd order sequences (Ba1 - Ba2).The boundary between the Badenian and the Sarmatian (SBD 4) is characterized as an erosional surface with deep channel structures. The filling of the channels appears in most cases as parallel reflectors with low amplitudes.The Sarmatian can be subdivided into two sequences. Inside the lower sequence often carbonate build-ups can be observed. For the Pannonian interpretation was only partly possible. It was possible to interpret a complete 3rd order cycle (Pa 1), but due to seismic quality at the top of the profiles no further cycles could be picked.

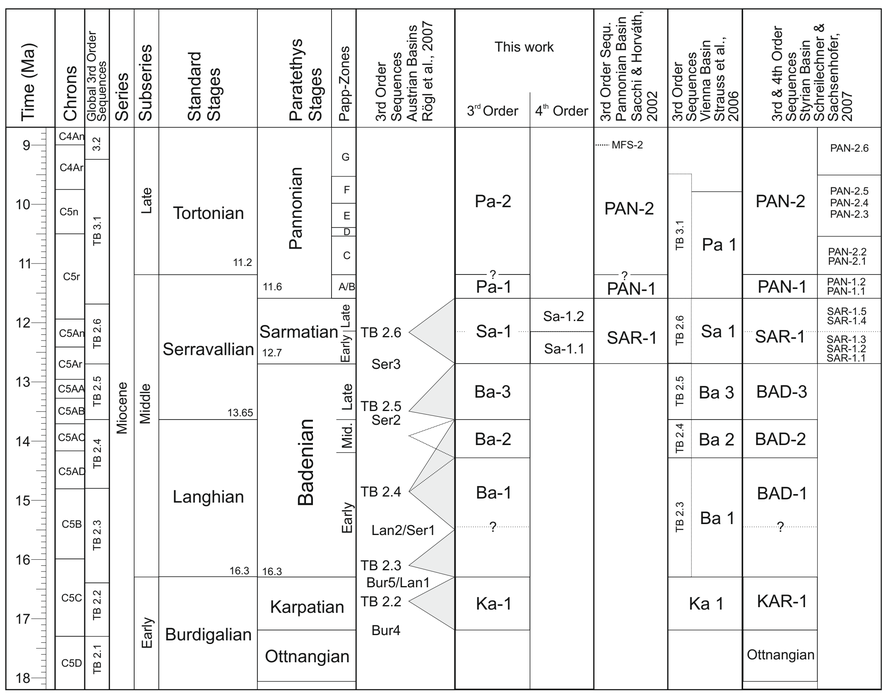

Fig. 3: Stratigraphic frame and geologic time scale.

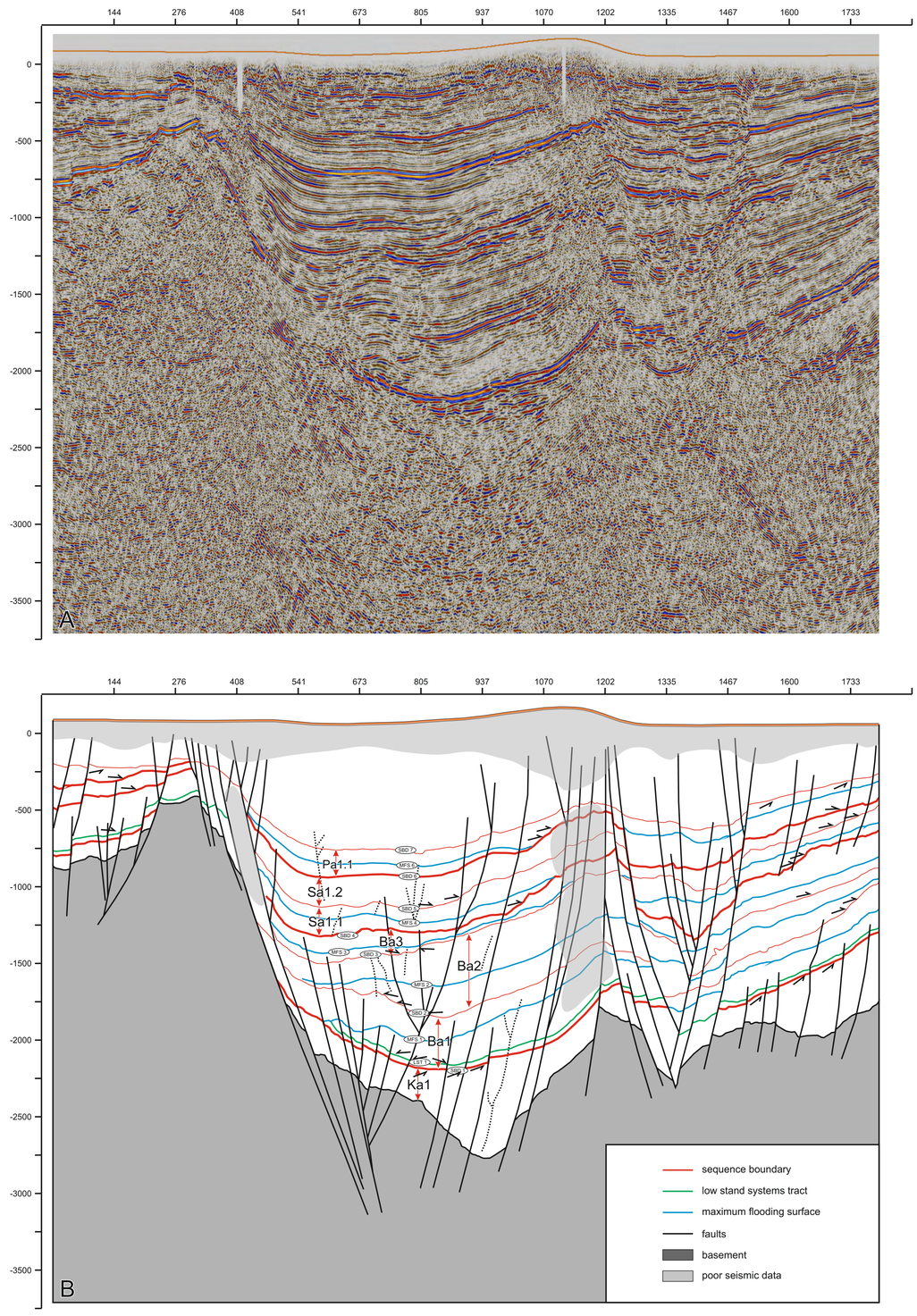

Fig. 4: Seismic section without (A) and with (B) sequence stratigraphic interpretation.

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